IN THE CLAIMS:

Claim 1 (currently amended) A device for a hybridization reaction between ~~a~~ target ~~molecule~~ molecules in a fluid and a probe, which comprises:

a microfluidic channel comprising a first portion and a second portion following said first portion, wherein said first portion has an irregular cross section and said second portion has ~~a~~ the probe, said irregular cross section being capable of producing shear stress on the target molecules in the fluid when the fluid passes through the first portion of the microfluidic channel; and

a fluid driving element connecting ~~connected~~ the ends of said channel with tubes, wherein said fluid driving element can move said target molecules back-and-forth for repeatedly passing through said second portion.

Claim 2 (original) The device of claim 1, wherein said irregular cross section is produced by irregularly changing the size of the cross section of said first portion of said channel.

Claim 3 (currently amended) The device of claim 1, wherein ~~the~~ an inner surface of said microfluidic channel is rough or has recess slots.

Claim 4 (original) The device of claim 1, wherein said probe is nucleic acid, peptide or peptide nucleic acid.

Claim 5 (original) The device of claim 4, wherein said nucleic acid is DNA or RNA.

Claim 6 (original) The device of claim 4, wherein said nucleic acid is single-stranded nucleic acid or double-stranded nucleic acid.

Claim 7 (original) The device of claim 1, which further comprises a means for providing energy to said target molecules.

Claim 8 (cancelled)

Claim 9 (withdrawn/currently amended) A process for increasing hybridization reaction between ~~a~~ target ~~molecule~~ molecules and a probe, comprising the following steps:

(a) providing the device of claim 1 ~~a microfluidic channel comprising a first portion and a second portion following said first portion, wherein said first portion has an irregular cross-section and said second portion has a first probe and second or more probes wherein said first probe specific binds to said target molecule~~;

(b) introducing a fluid containing said target ~~molecule~~ molecules into the microfluidic channel of the device ~~for hybridization reaction of the invention~~; and

(c) driving said fluid to flow back and forth so that said target ~~molecule~~ molecules can repeatedly pass through said second portion, with ~~whereby said~~ target molecules that do not bind to the probe ~~non-specific binding to the second or more probes are~~ being removed and the target molecules binding to ~~first~~ the probe ~~are~~ being

retained.

Claim 10 (withdrawn) The process of claim 9, wherein said probe is nucleic acid, peptide or peptide nucleic acid.

Claim 11 (withdrawn) The process of claim 10, wherein said nucleic acid is DNA or RNA.

Claim 12 (withdrawn) The process of claim 10, wherein said nucleic acid is single-stranded nucleic acid or double-stranded nucleic acid.

Claim 13 (withdrawn) The process of claim 9, wherein the surface of said channel is rough.

Claim 14 (withdrawn) The process of claim 9, wherein said irregular cross section is produced by irregularly changing the size of the cross section of said first portion of said channel.

Claim 15 (withdrawn) The device of claim 9, which further comprises a step for providing energy to said target molecules.

Claim 16 (new). The device of claim 4, wherein the irregular cross section is capable of producing a shear stress on single-stranded nucleic acid target molecules passing in the fluid through the first portion that is sufficient to change a conformation of the

single-stranded nucleic acid target molecules from coiled to linear.

Claim 17 (new). The device of claim 4, wherein the irregular cross section is capable of producing a shear stress on double-stranded nucleic acid target molecules passing in the fluid through the first portion that is sufficient to denature the double-stranded nucleic acid target molecules to produce single-stranded target molecules.

Claim 18 (new). The device of claim 4, wherein the irregular cross section is capable of producing a shear stress on protein target molecules passing in the fluid through the first portion that is sufficient to alter a three-dimensional structure of the protein target molecules so as to expose reaction sites of the protein target molecules.

Claim 19 (new). The device of claim 16, wherein the microfluidic channel further comprises a second probe in the second portion.

Claim 20 (withdrawn/new). A process for increasing a hybridization reaction between a target molecule and a probe comprising the following steps:

(a) providing the device of claim 16;

(b) introducing a fluid containing the single-stranded nucleic acid target molecules into the microfluidic channel of the device; and

(c) driving said fluid to flow back and forth so that said single-stranded nucleic acid target molecules repeatedly passes through said second portion with molecules that do not bind to the probe being removed and molecules that bind to the probe

being retained.

Claim 21 (withdrawn/new). A process for increasing a hybridization reaction between a target molecule and a probe comprising the following steps:

(a) providing the device of claim 17;

(b) introducing a fluid containing the double-stranded nucleic acid target molecules into the microfluidic channel of the device; and

(c) driving said fluid to flow back and forth so that said double-stranded nucleic acid target molecules repeatedly passes through said second portion with molecules that do not bind to the probe being removed and molecules that bind to the probe being retained.

Claim 22 (withdrawn/new) A process for increasing a hybridization reaction between a target molecule and a probe comprising the following steps:

(a) providing the device of claim 18;

(b) introducing a fluid containing the protein target molecules into the microfluidic channel of the device; and

(c) driving said fluid to flow back and forth so that said protein target molecules repeatedly passes through said second portion with molecules that do not bind to the probe being removed and molecules that bind to the probe being retained.